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09/497,482

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Masahiro Suzuki

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EXAMINER

HENN, TIMOTHY J

ART UNIT

PAPER NUMBER

2622

DATE MAILED: 05/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/497,482

Applicant(s)

SUZUKI ET AL.

Examiner

Timothy J. Henn

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 40-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-10, 47 and 48 is/are allowed.
- 6) ☒ Claim(s) 1-6, 11, 12 and 40-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 August 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 15 February 2006 has been entered.

Response to Arguments

2. Applicant's arguments filed 15 February 2006 have been fully considered but they are not persuasive. In the filed amendment Applicant amended the claims to require a block size of $(n-i) \times (m-j)$ for the second image data which is necessary for the recording process and argues that this feature is not taught or suggested by the cited references. However, as claimed, the block size of $(n-i) \times (m-j)$ is not required to be used for the recording processing. For example, the recording processing could occur on blocks of 8x8 pixels requiring the image to have at least 8x8 pixels. As claimed, the second image could have a block size of 4x4 pixels which would be necessary (but not sufficient) for recording processing to occur since a block of 4x4 pixels must exist if a block of 8x8 pixels exists in the image. Therefore, Applicant's arguments with respect to a second image having $(n-i) \times (m-j)$ blocks are not considered persuasive.

3. Applicant's arguments, see amendment, filed 15 February 2006, with respect to claims 7-10, 47 and 48 have been fully considered and are persuasive.
4. Applicant's arguments with respect to claims 11, 12, 43 and 48 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
6. Claims 1, 2, 4, 5, 40, 42, 45 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagasaki et al. (US 5,153,730) in view of Laroche et al. (US 5,373,322) in view of Kijima et al. (US 6,661,451).

[claim 1]

Regarding claim 1, Nagasaki discloses a digital camera comprising: an image capturing device that captures a subject image having passed through a taking lens and outputs image data (Figure 1, Item 12); a first image processing circuit that performs pre-treatment on image data corresponding to N lines X M rows output by the image capturing device (i.e. the inherent resolution of the imaging device) to create a first image data (Figure 1, Item 15); a first memory device in which the first image data is temporarily stored (Figure 1, Item 34); a second image processing circuit for processing the first image data stored in the first memory (Figure 1, Item 31 or 33); and a recording processing circuit that performs recording processing on the image data (Figure 1, Item 32). However, Nagasaki does not disclose performing format processing appropriate

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for recording processing on image data in units of blocks each ranging over n lines \times m rows in block sequence.

However, Nagasaki discloses that the imaging device used includes red, green and blue filters provided on the surface thereof (c. 4, l. 6-8). Laroche discloses that interpolation processing is used to convert sparsely sampled color image data to a full RGB image (c. 3, ll. 26-30) and further discloses a process which can be used to create full RGB images (Figures 3 and 4; c. 4, l. 32 - c. 6, c. 58). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include format processing as taught by Laroche which creates a full RGB image by processing in units of blocks to fill in missing data from the image obtained by the sensor of Nagasaki. Nagasaki in view of Laroche further lacks outputting image data in line sequence from the image capturing device.

However, outputting image data in line sequence (e.g. progressive or raster scanning) is notoriously well known in the art. For example, Kijima discloses a method of reading image data from a CCD device in which pixel signals are read in a line-sequential manner (i.e. in units of lines in line sequence) in order to obtain fine image data (e.g. c. 3, ll. 51-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to read out image data in line sequence in the camera of Nagasaki in view of Laroche as taught by Kijima to obtain a fine image. It is noted that the image data will be processed in the manner it is output by the first image processing circuit of Nagasaki (see Figure 1). While the claim requires the second image to have a block size of $(n-i) \times (m-j)$ for the second image and requires this

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block size to be necessary for recording processing it does not require that the $(n-i) \times (m-j)$ be used for the recording processing or be sufficient for recording processing.

Therefore, since a block size can be defined for the second image (e.g. a 4x4 block or even a 1x1 block) which is necessary for recording processing, the examiner considers this limitation of the claim to be met.

[claim 2]

Regarding claim 2, Nagasaki discloses a recording processing circuit which is a compression circuit (Figure 1, Item 32).

[claims 4 and 5]

In regard to claims 4 and 5, note that these claims contain all limitations of claims 1 and 2 with the inclusion of a storage medium having a program stored therein to store a method which performs the steps taken by the apparatus in claims 1 and 2. Official Notice is taken that it is well known in the art to implement methods in software to take advantage of general purpose hardware which does not need to be specifically designed for a single application and allows for easy upgrading. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a software version of the apparatus of claims 1 and 2 as claimed in claims 4 and 5.

[claim 40]

Regarding claim 40, Nagasaki discloses a second memory device in which the second image data is temporarily stored, wherein the recording processing circuit performs the recording processing on the second image data stored in the second

memory device (Figure 1, Item 37; c. 5, ll. 28-38).

[claim 42]

Regarding claim 42, Nagasaki discloses a first memory device which temporarily stores at least one frame of the image data (Figure 1, Item 34).

[claim 45]

Regarding claim 45, Nagasaki discloses an image capture device which captures a subject image to output an analog image data and includes an A/D converter that converts the analog imaging signal to the image data that is digital (Figure 1; Items 12 and 16).

[claim 46]

Regarding claim 46, Nagasaki discloses creating luminance and color difference signals from the image data using image data (i.e. blocks) (c. 8, l. 46 - c. 9, l. 53). The examiner notes that such luminance and color difference data is inherently appropriate for compression.

7. Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagasaki et al. (US 5,153,730) in view of Laroche et al. (US 5,373,322) in view of Kijima et al. (US 6,661,451) in view of Miyake (US 5,631,701).

[claim 3]

Regarding claim 3, Nagasaki in view of Laroche in view of Kijima discloses format processing which includes interpolation processing, LPF and BPF processing and color different signal processing (Laroche; Figure 2; The examiner notes that since

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the averaging used in the interpolation processing of Laroche removes some high frequency data it can be considered LPF and BPF as well as interpolation). However, Nagasaki in view of Laroche in view of Kijima lacks pre-processing including white balancing and gamma correction.

Miyake discloses that white balancing and gamma correction can be included in image preprocessing circuits (c. 3, ll. 50-62). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include white balancing and gamma correction in the system of Nagasaki in view of Laroche in view of Kijima to obtain images which are white balanced and gamma corrected.

[claim 6]

In regard to claim 6, note that these claims contain all limitations of claim 3 with the inclusion of a storage medium having a program stored therein to store a method which performs the steps taken by the apparatus in claim 3. Official Notice is taken that it is well known in the art to implement methods in software to take advantage of general purpose hardware which does not need to be specifically designed for a single application and allows for easy upgrading. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a software version of the apparatus of claim 3 as claimed in claim 6.

8. Claims 11, 12, 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagasaki et al. (US 5,153,730) in view of Mahant-Shetti et al. (US

6,529,238) in view of Kijima et al. (US 6,661,451).

[claim 11]

Regarding claim 1, Nagasaki discloses a digital camera comprising: an image capturing device that captures a subject image having passed through a taking lens and outputs image data (Figure 1, Item 12); a first image processing circuit that performs pre-treatment on image data corresponding to N lines X M rows output by the image capturing device (i.e. the inherent resolution of the imaging device) to create a first image data (Figure 1, Item 15); a first memory device in which the first image data is temporarily stored (Figure 1, Item 34); a second image processing circuit for performing format processing appropriate for recording on the first image data stored in the first memory (Figure 1, Item 31 or 33; c. 8, ll. 48-55); and a recording processing circuit that performs recording processing on the image data (Figure 1, Item 32). However, Nagasaki does not disclose median processing on blocks of $n \times m$ pixel data.

Mahant-Shetti teaches that a median filter can be applied to a 3×3 block of image data to remove white spot noise from an image. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform median filtering on the image data of Nagasaki on image data in block sequence to remove white spot noise from the image. However, Nagasaki in view of Mahant-Shetti does not disclose first image processing which is performed in line sequence.

However, outputting image data in line sequence (e.g. progressive or raster scanning) is notoriously well known in the art. For example, Kijima discloses a method of reading image data from a CCD device in which pixel signals are read in a line-

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sequential manner (i.e. in units of lines in line sequence) in order to obtain fine image data (e.g. c. 3, ll. 51-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to read out image data in line sequence in the camera of Nagasaki in view of Juenger as taught by Kijima to obtain a fine image. It is noted that the image data will be processed in the manner it is output by the first image processing circuit of Nagasaki (see Figure 1).

[claim 12]

Regarding claim 12, the examiner notes that the processing of Juenger will be applied to a finite number of sets of data depending on the resolution of the image taken by Nagasaki, and that the values i and j can be set such that $(n-i) \times (m-j)$ will equal the number of sets processed.

[claims 43 and 44]

Claims 43 and 44 contain the limitations of claims 11 and 12 respectively. Therefore, claims 43 and 44 are analyzed and rejected as previously discussed with respect to claims 11 and 12.

9. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagasaki et al. (US 5,153,730) in view of Laroche et al. (US 5,373,322) in view of Kijima et al. (US 6,661,451) in view of Anderson (US 6,532,039).

[claim 41]

Regarding claim 41, Nagasaki in view of Laroche in view of Kijima lacks a camera in which the first and second memory are the same memory device. Anderson

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discloses a camera which includes a DRAM memory device (Figure 3, Item 346; Figure 4; c. 4, l. 66 - c. 5, l. 26) which is used for storing both recently captured data (similar to memory 34 of Nagasaki) and data which is being processed (similar to memory 37 of Nagasaki). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make memory devices 34 and 37 of Nagasaki a single memory device as taught by Anderson to reduce the number of components in the camera.

Allowable Subject Matter

10. Claims 7-10, 47 and 48 are allowed.

[claims 7-10, 47 and 48]

Regarding claims 7-10, 47 and 48 the prior art does not teach or fairly suggest a digital camera comprising: an image-capturing device that captures a subject image; a recording processing circuit that performs recording processing; and an image processing that calculates color differences signals, performs simultaneous low pass filtering and interpolation processing on the color difference signals using filter coefficients and then performs matrix processing appropriate for recording performed at the recording processing circuit to generate a formatted signal wherein the interpolation and low pass filtering processing are carried out by an arithmetic operation and further color difference signals obtained by the interpolation processing are assigned to pixels having no color difference signal as claimed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Henn whose telephone number is (571) 272-7310. The examiner can normally be reached on M-F 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TJH
4/29/2006


TUAN HO
PRIMARY EXAMINER